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**STUDY OF RECREATIONAL LAND AND OPEN SPACE
USING SKYLAB IMAGERY**

Monthly Progress Report, April 1975

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NASA Technical Monitor

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STUDY OF RECREATIONAL LAND OPEN SPACE
USING SKYLAB IMAGES

Monthly Progress Report, April 1975

CURRENT ACTIVITY

During April, major activity was devoted to selecting training sets in the Gratiot-Saginaw State Game Area that are representative of the major terrain and vegetation classes in the test area. A total of 35 separate training sets were selected based on photointerpretation of high-altitude color infrared photography of the area acquired in June 1972. These training sets included such diverse terrain types as wetlands, brush, and wooded areas of varying tree crown density. Separate training sets were selected for pine and for regenerated aspen, the latter being of particular interest in deer habitat studies.

Groups of S-192 pixels corresponding to each training set selected from the photography were identified on digital greymaps. The signature for each training set was then extracted from the S-192 digital tapes. Such signatures include the means and standard deviations of data values in each spectral channel and a covariance matrix for all spectral channels. Subsequently, all signatures were analyzed as to their statistical uniqueness by computing the probability of misclassification for all possible pairs of signatures.

A similar procedure was used to extract signatures of the same training areas from a magnetic tape of ERTS digital data acquired on 8 June 1973 (Frame 1320-15525).

A preliminary analysis was conducted of the matrix of probabilities of misclassification for both the S-192 signatures and the ERTS signatures. This analysis indicated that certain signatures of similar vegetation types had relatively high probabilities of misclassification and should logically be combined into a single signature for each major class. This would result in a single class of trees having a broad range of crown densities and two or three types of wetlands. It was also clear that substantially different terrain classes (e.g., wetlands and brush) could be reliably discriminated. In addition, it was noted that areas of pine and regenerated aspen could be discriminated from other surface types. These conclusions were drawn from both the S-192 data and the ERTS data, although discrimination of individual pairs of signatures were performed better by S-192 in some cases and by ERTS in others.

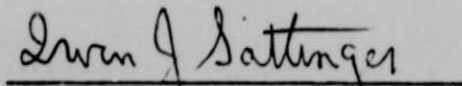
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FUTURE WORK

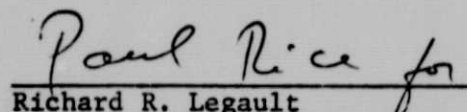
During May, a series of computer runs will be made to conclude the major portion of the S-192 analysis. Based on the preliminary analysis of the 35 test areas, a group of about 10 signatures will be derived by combining similar training sets for the S-192 data and for the corresponding ERTS data. The optimum channels for the S-192 data will be determined, and the four best channels used for computing probability of misclassification of the 10 signatures. Probability of misclassification of the same test areas using the ERTS data will also be computed. The resulting data will be analyzed to determine reliability of S-192 discrimination of major grain and vegetation classes, and comparative performance of ERTS data.

The ERIM computer is to be shut down on 8 May for a period of one month, while it is being moved from the Willow Run Airport laboratories to its location in ERIM's new laboratories in Ann Arbor. During the shutdown, project effort will be concentrated on analysis of the computer data obtained before the shutdown.

Respectfully submitted:


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IJS:RRL:dlc